FINAL AI REPORT

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Project:

1.N-Queen CSP

2.Sodoku CSP

3.Minesweeper auto solver

File submitted:

1.Source Code in Eclipse

2.Source Code in Netbean

3.Demonstrations in file Jar

4.Documentation

I) Introdution

This report will be submit for AI Lab Project Spring 2013, That includes source code and documentations.

Its written base on AIMA JAVA library, the IDE developed used for project is Netbean 7.0.2 and Eclipse Juno.

Beacase of Component in Netbean can read HTML Script, so, each project the component will be show the data from the script via Interface.

Other teachnical that i used is Thread synchonize. It make GUI and Computing in machine be synchonized.

Beacause lack of knowledge about OpenGL, so, I can not config to run OpenGL on another computer, so in may demo, it can not run on Open GL

For Sodoku Project: in Menu "Solver CSP Quick Here" I fixed time delay when update GUI(graphical user interface), so the code run faster, time excute is under 1second

II)CSP

1.N-QUEEN

*I finish Search N-Queen by **Hill Climbing** and **SA Algorithm** in my project (Menu "Solver/HillClimbing Search"), but its lab for funning, and don't have many function, so I do not submit Hill Climbing Alrgorithm.*

a)CSP Description:

- -Presentation in binary: 2 queen is make contraint each other.
- -Describe "isSatisfiedWith(Assignment assignment)": two queen is satisfied if and only if they do not have same row id , column id and cross id (that mean they do not attack other)

- CSP have to base on List Of Variable so I create class 'SodokuVariableCollection' be extended ArrayList<Variable> that initinize from nuber of Queen that user enter.

GUI Update

- ✓ In my project I used interface class INQueenListener. It used for update location of queen on the board in GUI Screen when Assignment set domain for variable
- ✓ When assignent assign domain for variable, it will be generate the HTML sctrip to show current step in GUI (Graphical User Interface).

b)Search:

It implements backtracking search, In other request, it can be change to Improvedbacktracking Search and use MRV or DH to solve.

2.Sodoku:

CSP Desciption:

- If we known the number of one variable i will set its domain = {number}, and other i set domain ={1->9}
- After set list of domain for variable i sorted List Variable in region other by setted variable domain will be first. tthis tip will increase the speed of search CSP when Apply backtracking Search.
- We have the 9 variable for each reagion, that mean 9 variable can be the same number,
- ***My Argorithm*** :
  i. I use the HashSet to store number 1 to 9,
  ii. Fore each variable in 9 variables , i get Domain of variable, if domain is in HashSet i will remove number of domain in HashSet.
  iii. in the end of loop, if hashset is Exists data(HashSet.Size()>0) it will return false; if not exist it the region variable will satisfy.

Update GUI

- In this project, i also use script in HTML to show the problem in GUI, that is Table store number and region color.
- In project I changed color of variable that have one domain.

Advance:

Solve very quick in meu: ‘Sovler/Solver CSP Here’

II) CNF: MineSweeper

1) Introsuciton:

I have 3 basic step:

1) I will auto genarate board, pick some cell and make it hidden.
2) Create CNF
3) User aima Libray to resolution

2) Detail

- Genarate board: Apply some teachnical in DataStructure and Algorithm to genarate board with hidden cells
- How to gen CNF form board:
- for each visible cell, i count number of hidden cell and store it to list and make combination by using math knowledge

- Used AIMA libary to solve;

3) Disavantage:

- The program will be taked a lot of time when increase Mine in board.
- I don't use statstics math in this solve, so, some speacial case can not solve.